GREY WATER DISPOSAL FROM PLEASURE BOATS

BACKGROUND INFORMATION

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Introduction

As recreational boating has increased over the past few years, so have concerns about its environmental impact on Ontario's water resources. A key concern focuses on the disposal of waste water from pleasure boats. Two regulations of the Environmental Protection Act address this issue. Regulation 305 prohibits pleasure boats from discharging sewage into the water and Regulation 310 concerns the pump-out facilities at marinas. Currently, Regulation 305 prohibits the discharge of toilet waste ("black water"), but not of "grey water," that is household waste from sinks, showers and similar sources.

The Ministry of the Environment is convinced that discharging grey water into lakes, rivers or other bodies of water is detrimental to the environment. The ministry, therefore, has decided to make the legislative changes necessary to prohibit the discharge of grey water from pleasure boats.

The information in this document explains the background to the ministry's decision, including a summary of a grey water study undertaken for the ministry by Beak Consultants Limited.

In order to determine the most appropriate action to take, the Ministry of the Environment needed several important pieces of information. This information included:

- •The chemical and biological composition of grey water;
- •The amount of grey water produced by the approximately 45,000 pleasure boats in Ontario;
- •A realistic estimate of marine pump-out capacity in recreational boating areas; and
- •Viable alternatives to the current regulations.

The Beak Consultants Study

Beak Consultants used a methodology that would ensure that their results would be a realistic reflection of the actual grey water situation. They chartered three different kinds of boats -- sail, power and houseboat -- for three weeks each. Three different crews, some including children, used each boat. Each vessel had a shower and sink in the toilet area, as well as a galley sink. The consultants took grey water samples from fittings on board the boats.

As well, the consultants did three tests of water where pleasure boats were moored. Two tests were done in enclosed bays (embayments) in southern Georgian Bay and one in an embayment in the Trent Canal. The consultants also surveyed the available pump-out capacity in selected areas within some of the province's most popular boating districts: the Trent and Rideau Canal systems, southern Georgian Bay, the Toronto area and Lake of the Woods.

The samples from the boats were analyzed for bacterial and chemical content. Samples from the embayments were tested for bacterial content only.

The Findings

The study discovered that grey water produced on board pleasure boats contains bacterial contamination in levels or concentrations that could be potentially hazardous to human health, according to the ministry's objectives, or standards, for recreational water. For example, Pseudomonas aeruginosa was present in very significant concentrations of 1,000 to 1,000,000 per 100 ml. of grey water. Normally, this organism appears in concentrations of less than 50 per 100 ml. of water. Pseudomonas aeruginosa is a pathenogenic, or disease-causing organism which can cause eye and ear infections in swimmers. It is also highly likely that other disease-causing organisms, such as salmonella, which were not specifically tested for, would be found in grey water.

The study also found that grey water samples taken from boats contains between 600 and 1,000,000 E.coli bacteria per 100 ml. The ministry does not have objectives for E. coli in water used for swimming and bathing. E.coli, however, fall within the general category of fecal coliforms. The ministry's objective for fecal coliforms in recreational water is 100 per 100 ml of water.

Evidence of chemical pollution, as well, was found. While the actual volume of substances such as phosphorus and ammonia was small, because they were

found in high concentrations, they, too, have the potential for contamination, particularly at the local level.

There was a considerable variation in the amount of grey water each person produced each day, ranging from 4.8 and 31.8 litres. A reasonable average is 15 to 18 litres per day.

Water samples taken from the bays in which the boats were moored also showed evidence of contamination. While it was not possible to develop sufficiently controlled testing conditions to determine the statistical relationship between the number of boats and density of bacteria, it is obvious that the more boats in an embayment, the more significant the impact of grey water in that bay will be.

In the popular areas surveyed, pump-out stations open to the public operate at only 20 per cent of their capacity, a clear indication that there are adequate pump-out facilities in these areas to accommodate grey water from pleasure boats. In some northern areas, more pump-out stations are required.

The ministry concluded that discharging grey water reduces water quality by increasing the concentrations of bacteria and chemical pollutants in the surrounding water and that action should be taken either to prohibit its discharge from pleasure boats or alleviate the effects of its discharge.

Alternative Actions Examined by the Ministry

The ministry considered a number of options to discharging grey water, which will be discussed below. Those options were treatment and discharge; prohibiting discharge in environmentally sensitive waterways only; retaining grey water in certain types of boats; retaining grey water in new boats only; and retaining grey water in all boats. The ministry has chosen the last option as the most effective.

Treatment and Discharge

This option calls for grey water to be chlorinated and discharged.
This option was rejected for several reasons: disinfection would not be effective under these conditions; the chemical components of the sewage would not be treated; difficulties in ensuring user maintenance of equipment and in general enforcement.

Prohibiting Discharge in Sensitive Waterways

There were several obvious drawbacks to this option. In addition to the main sensitive areas, there are a very large number of small, sensitive waterways. Boats would likely travel in an out of these areas regularly. For the boater to be familiar with the exact boundaries of areas designated as sensitive could be extremely difficult. For the ministry to determine such areas and enforce retention would be onerous, unwieldy and time-consuming.

Certain Boats to Retain Grey Water

Houseboats, or boats over a certain length or displacement, have been mentioned most frequently in this regard.

Again, there are a number of drawbacks to implementing this option. Firstly, it would be difficult to arrive at a legal definition of houseboats. Secondly, since houseboats make up only a small proportion of the total number of boats (perhaps as little as 1.5 per cent), the impact on water quality of this option would not be great. Finally, since the vast majority of boats discharging grey water are sail or power boats, establishing criteria based on length or displacement would not be easy or equitable.

New Boats to Retain Grey Water

While requiring new boats to be built with grey water retention tanks would be the simplest option, it would not be highly effective. The approximately 45,000 pleasure boats that now exist have a long life expectancy. If they were allowed to continue to discharge grey water, it would take an unacceptably long time to suitably reduce the amount of grey water being discharged into Ontario's lakes and rivers.

All Boats to Retain Grey Water

This option calls for grey water to be retained on board and pumped out at marine stations. As the most environmentally sound option, and the one that could be applied most equitably to all boaters, it is the ministry's preferred option. It is also the least complicated option to enforce. The ministry recognizes that this option does present some difficulties (installation in some types of boats, compliance of out-of-province boats) but believes that its overall effectiveness and fairness make it the most suitable alternative.

Other Important Points

•The cost of retrofitting existing boats to retain grey water will vary. Estimates run between $700 and $950 to plumb grey water into an existing black water tank on a sail or power boat; between $800 and $1,200 to add 30 to 80 litres capacity to a new boat; and between $1,500 and $1,600 to add 200 litres to existing capacity.

•Because it is unacceptable to the ministry to condone pollution from any source, out of province vessels, as well as Ontario-registered boats, will be required to retain their grey water. This is in accord with the present regulations for retaining black water, which apply to all boats on Ontario waterways. It should be noted that on some lakes, New Hampshire and New York already require that grey water be retained on pleasure boats.

•Since pump-out stations along most of the province's major recreational waterways are not used to capacity, there should be adequate facilities to pump out grey water. In areas of the province where the facilities are not adequate (northern Georgian Bay, North Channel and Lake Superior) the government will examine measures to increase the number of facilities.

•The ministry's objective is to set a deadline of May 1, 1993 for all boats to conform to the revised regulations.

•The ministry's paper, GREY WATER DISPOSAL FROM PLEASURE BOATS, Background information on the amendment of Regulations 305 and 310 made under the Environmental Protection Act, sets out the information in this publication in greater detail. It is available through the Public Information Centre, Environment Ontario, 135 St. Clair Avenue West, Toronto, Ontario M4V 1P5 (416) 323-4321.

•The complete report from Beak Consultants is also available through the Public Information Centre.

DISCHARGING SEWAGE FROM PLEASURE CRAFT

AMENDMENTS TO ONTARIO REGULATIONS 305 AND 310 UNDER THE ENVIRONMENTAL PROTECTION ACT

1. REGULATIONS AS EXISTING

Regulation 305 - Discharge of Sewage from Pleasure Boats

The regulation prohibits the discharge into water of treated or untreated sewage from all pleasure boats (including chartered boats and houseboats). Sewage includes toilet waste, as well as litter, refuse, etc., but does not include household wastewater from sinks, showers, etc., commonly referred to as grey water.

All toilet-equipped pleasure craft must also be equipped to store toilet sewage by means of holding tanks or incineration systems. Such storage equipment must have deck fittings for removal of toilet waste at pump-out facilities.

Portable toilets are allowed only if they are secured to the boat and adapted to a deck fitting for pump-out.

All pleasure boats in Ontario waters, including those which are foreign-owned, must comply with Ontario regulations. Violators of pleasure-craft regulations are subject to prosecution by means of an offence notice issued under the Provincial Offences Act.

Regulation 310 - Marinas

The regulation requires that commercial marinas, including yacht clubs, provide or arrange for pump-out facilities for toilet-equipped pleasure boats. All marinas are required to provide convenient litter containers for the use of boaters.

2. AMENDMENT TO THE REGULATIONS

Regulation 305

The definition of sewage will be amended to include grey water. This means that grey water will be regulated in the same way as toilet waste is now regulated: i.e., grey water may not be discharged into the water, must be stored on board the boat, and must have deck fittings for removal of sewage at pump-out facilities. The discharge of litter, refuse, etc. will continue to be prohibited under the definition of "litter".

Regulation 310

Amendment of the definition of "sewage" to include grey water.

TIME SCHEDULE

It is proposed that the amended regulations will be enforced on all pleasure boats, whether new or existing, on May 1, 1993.